

CLAIMS

1 1. A method for manufacturing a glass or ceramic disk substrate for a rotating disk
2 drive data storage device, comprising the steps of:

3 providing a ceramic or glass disk substrate having a circumferential edge;
4 loading said disk substrate to an edge finishing apparatus; and
5 grinding said circumferential edge of said disk substrate in a ductile grinding
6 regime using said edge finishing apparatus.

1 2. The method for manufacturing a glass or ceramic disk substrate of claim 1,
2 wherein said disk drive data storage device is a rotating magnetic disk drive data storage
3 device, said disk substrate being subsequently coated with a magnetic coating after said
4 grinding step.

1 3. The method for manufacturing a glass or ceramic disk substrate of claim 1, further
2 comprising the step of coarse grinding said circumferential edge in a non-ductile mode,
3 said step of coarse grinding said circumferential edge in a non-ductile mode being
4 performed before said step of grinding said circumferential edge in a ductile grinding
5 regime.

1 4. The method for manufacturing a glass or ceramic disk substrate of claim 1,
2 wherein said disk substrate contains an outer circumferential edge at the periphery thereof
3 and a central aperture defining an inner circumferential edge, and wherein said grinding
4 step is applied to both said outer circumferential edge of said disk substrate and to said
5 inner circumferential edge.

1 5. The method for manufacturing a glass or ceramic disk substrate of claim 1,
2 wherein said grinding step comprises grinding said edge with a formed grinding appliance
3 conforming to an edge radius at said circumferential edge.

1 6. The method for manufacturing a glass or ceramic disk substrate of claim 1,
2 wherein said grinding step comprises bringing a grinding appliance of said edge finishing
3 apparatus in contact with said circumferential edge and providing relative motion
4 between said grinding appliance and circumferential edge of approximately 30 m/sec or
5 more.

1 7. The method for manufacturing a glass or ceramic disk substrate of claim 1,
2 wherein said edge finishing apparatus comprises a grinding appliance having diamond
3 particles of approximately 6 microns or less.

1 8. The method for manufacturing a glass or ceramic disk substrate of claim 1,
2 wherein said glass or ceramic disk substrate is finished for installation in a disk drive data
3 storage device without chemical strengthening of said disk substrate.

1 9. The method for manufacturing a glass or ceramic disk substrate of claim 8,
2 wherein said glass or ceramic disk substrate is of a material which is not chemically
3 strengthenable.

1 10. A method for manufacturing a glass or ceramic disk substrate for a rotating disk
2 drive data storage device, comprising the steps of:

3 providing an ceramic or glass disk substrate having a cut, unfinished
4 circumferential edge, wherein said ceramic or glass disk substrate material is not
5 chemically strengthenable; and

6 finishing said circumferential edge of said disk substrate to a finished state
7 suitable for use in a disk drive data storage apparatus using at least one edge finishing
8 apparatus.

1 11. The method for manufacturing a glass or ceramic disk substrate of claim 10,
2 wherein said step of finishing said circumferential edge of said disk substrate comprises
3 grinding said edge in a ductile grinding regime.

1 12. The method for manufacturing a glass or ceramic disk substrate of claim 10,
2 wherein said disk drive data storage device is a rotating magnetic disk drive data storage
3 device, said method further comprising the step of coating at least one flat surface of said
4 disk substrate with a magnetic coating, said coating step being performed after said
5 grinding step.

1 13. The method for manufacturing a glass or ceramic disk substrate of claim 10,
2 wherein said disk substrate contains an outer circumferential edge at the periphery thereof
3 and a central aperture defining an inner circumferential edge, and wherein said finishing
4 step comprises finishing both said outer circumferential edge of said disk substrate and
5 said inner circumferential edge.

1 14. The method for manufacturing a glass or ceramic disk substrate of claim 10,
2 wherein said step of finishing said circumferential edge grinding step comprises forming
3 an edge radius at said circumferential edge.

1 15. A method for manufacturing a glass or ceramic disk substrate for a rotating disk
2 drive data storage device, comprising the steps of:
3 providing a ceramic or glass disk substrate having a cut, unfinished
4 circumferential edge;
5 finishing said circumferential edge of said disk substrate to a finished state
6 suitable for use in a disk drive data storage apparatus by application of mechanical forces
7 using at least one edge finishing apparatus, said finishing step being accomplished
8 without chemical strengthening of said glass disk substrate.

1 16. The method for manufacturing a glass or ceramic disk substrate of claim 15,
2 wherein said disk substrate is of a material which is not chemically strengthenable.

1 17. The method for manufacturing a glass or ceramic disk substrate of claim 15,
2 wherein said step of finishing said circumferential edge of said disk substrate comprises
3 grinding said edge in a ductile grinding regime.

1 18. The method for manufacturing a glass or ceramic disk substrate of claim 15,
2 wherein said disk drive data storage device is a rotating magnetic disk drive data storage
3 device, said method further comprising the step of coating at least one flat surface of said
4 disk substrate with a magnetic coating, said coating step being performed after said
5 grinding step.

1 19. The method for manufacturing a glass or ceramic disk substrate of claim 15,
2 wherein said disk substrate contains an outer circumferential edge at the periphery thereof
3 and a central aperture defining an inner circumferential edge, and wherein said finishing
4 step comprises finishing both said outer circumferential edge of said disk substrate and
5 said inner circumferential edge.

1 20. The method for manufacturing a glass or ceramic disk substrate of claim 15,
2 wherein said step of finishing said circumferential edge grinding step comprises forming
3 an edge radius at said circumferential edge.

1 21. A disk for a rotating disk drive data storage device, comprising a disk-shaped
2 glass or ceramic substrate which is finished for installation in a disk drive data storage
3 device, wherein said disk-shaped glass or ceramic substrate is not chemically
4 strengthened.

1 22. The disk for a rotating disk drive data storage device of claim 21, wherein said
2 disk-shaped substrate comprises a circumferential edge having a radius.

1 23. The disk for a rotating disk drive data storage device of claim 22, wherein said
2 disk-shaped substrate has a central aperture defining an inner circumferential edge radius,
3 and wherein said disk-shaped substrate has a first circumferential edge radius at said inner
4 circumferential edge, and a second circumferential edge radius at an outer circumferential
5 edge thereof.

1 24. The disk for a rotating disk drive data storage device of claim 21, further
2 comprising a magnetic layer for recording magnetically encoded data on at least one
3 surface of said disk.

1 25. The disk for a rotating disk drive data storage device of claim 21, wherein said
2 disk-shaped substrate comprises a circumferential edge finished by a process of grinding
3 in a ductile regime.

1 26. A disk for a rotating disk drive data storage device, comprising a disk-shaped
2 substrate which is of a glass or ceramic material which is not chemically strengthenable.

1 27. The disk for a rotating disk drive data storage device of claim 26, wherein said
2 disk-shaped substrate comprises a circumferential edge having a radius.

1 28. The disk for a rotating disk drive data storage device of claim 27, wherein said
2 disk-shaped substrate has a central aperture defining an inner circumferential edge radius,
3 and wherein said disk-shaped substrate has a first circumferential edge radius at said inner
4 circumferential edge, and a second circumferential edge radius at an outer circumferential
5 edge thereof.

1 29. The disk for a rotating disk drive data storage device of claim 26, further
2 comprising a magnetic layer for recording magnetically encoded data on at least one
3 surface of said disk.

1 30. The disk for a rotating disk drive data storage device of claim 26, wherein said
2 disk-shaped substrate comprises a circumferential edge finished by a process of grinding
3 in a ductile regime.

1 31. A disk for a rotating disk drive data storage device, comprising a disk-shaped
2 substrate which is of a glass or ceramic material, said disk-shaped substrate having a flat
3 data recording surface and a circumferential edge radius at a circumferential edge of said
4 flat data recording surface.

1 32. The disk for a rotating disk drive data storage device of claim 31, wherein said
2 circumferential edge radius is at least 0.175 mm.

1 33. The disk for a rotating disk drive data storage device of claim 31, wherein said
2 circumferential edge radius is approximately one-half the width of said disk-shaped
3 substrate at the circumferential edge thereof, said substrate having an edge cross-section
4 in a plane of the disk axis comprising approximately a semi-circle.

1 34. The disk for a rotating disk drive data storage device of claim 31, wherein said
2 disk-shaped substrate has a central aperture defining an inner circumferential edge radius,
3 and wherein said disk-shaped substrate has a first circumferential edge radius at said inner
4 circumferential edge, and a second circumferential edge radius at an outer circumferential
5 edge thereof.

1 35. The disk for a rotating disk drive data storage device of claim 31, further
2 comprising a magnetic layer for recording magnetically encoded data on said flat data
3 recording surface.

1 36. The disk for a rotating disk drive data storage device of claim 31, wherein said
2 disk-shaped substrate is of a material which is not chemically strengthened.

1 37. The disk for a rotating disk drive data storage device of claim 36, wherein said
2 disk-shaped substrate is of a material which is not chemically strengthenable.

1 38. The disk for a rotating disk drive data storage device of claim 31, wherein said
2 circumferential edge is finished by a process of grinding in a ductile regime.

1 39. A rotating disk drive data storage device, comprising:
2 a disk drive base;
3 a rotatably mounted disk and spindle assembly, said disk and spindle assembly
4 comprising at least one disk for recording data on at least one surface of said at least one
5 disk, said at least one disk comprising a glass or ceramic substrate which is not
6 chemically strengthened; and
7 at least one transducer mechanism for accessing data recorded on said at least one
8 surface of said at least one disk.

1 40. The rotating disk drive data storage device of claim 39, wherein said glass or
2 ceramic substrate is of a material which is not chemically strengthenable.

1 41. The rotating disk drive data storage device of claim 39, wherein said at least one
2 disk further comprises a magnetic layer for recording magnetically encoded data on said
3 at least one surface of said at least one disk.

42. The rotating disk drive data storage device of claim 39, wherein said at least one disk comprises a circumferential edge having a radius.

43. The rotating disk drive data storage device of claim 39, wherein said at least one disk comprises a circumferential edge which is finished by a process of grinding in a ductile regime.

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